FARM ORGANIZATION AND INCOME IN RELATION TO SOIL CONSERVATION, COSHOCTON COUNTY, OHIO

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Introduction

In the fall of 1946 a study was made in Coshocton County to determine some of the economic benefits from conservation farming. Farm management data were obtained from 52 farmers who were cooperating with the Coshocton County Soil Conservation District. Some of these farmers had applied most of the recommended soil and water conservation practices on their farms. Others had applied only a few of the needed measures for various reasons. For comparative purposes the farms were divided into two equal groups on the basis of the amount of conservation practices applied to the land. Farms which had the most conservation practices were placed in the group designated as high conservation farms in this report. Farms which had the least amount of conservation practices were placed in the low conservation group of farms.

Today considerable emphasis is being placed on conservation farming. The term conservation farming should be considered as a relative manner since practically every farmer is following some conservation practices. Every time a farmer applies some lime or fertilizer or raises a legume crop he is practicing some conservation on his farm. On most farms conservation farming means the application of more practices that will preserve the farm as a producing unit. The purpose of this study is to show the differences in farm organization and income on two groups of farms where different degrees of soil conservation were practiced.

Description of the Agriculture of the Area

Most of the farms in this study are in the northern part of Coshocton County, which is located in east central Ohio. Farming in this area is roughly representative of large portions of eastern and southeastern Ohio. The farms averaged approximately 125 acres in size. Cultivated crops are raised on less than one-half of the total farm acreage, except on the bottom lands. Few farms are operated by tenants. With the exception of wheat, the crops are marketed through livestock and its products.

Coshocton County is located in the unglaciated part of Ohio. The topography is hilly with some bottom land along the rivers and small streams. Practically all of the cultivated land located on slopes is subject to erosion. The soil types are Muskingum and the related series. On the upland soils the organic matter is low, and lime is needed unless this material has been applied recently. On many of the upland farms one-half to three fourths of the original topsoil has been eroded from the cropland.

The Recommended Soil Conservation Program

The recommended soil and water conservation program for this area includes, (1) proper land use, (2) good rotations, (3) improvement of the permanent pasture, (4) liming and fertilizing the cropland, (5) woodland management and (6) contour strip cropping on the rolling land.

In planning farms for soil and water conservation the first step is to determine the amount of land that may be used for crops, permanent pasture and woods. These three major classifications of the land will depend upon the soil type, the slope of the land and the amount of erosion that has occurred. Cropland will be limited to the areas on which the recommended mechanical and agronomic practices will control erosion. Permanent pasture land will include the land too steep for crops, but not too steep to be improved with modern

farm equipment. The forest land will consist of the areas too steep for permanent pasture.

The recommended rotation for the cropland specifies that at least one-half of the rotated area will be in meadow crops each year. Legume-grass meadows are recommended for maximum soil improvement and the control of erosion on the strip cropped land. The amount of permanent pasture that should be improved will depend upon the needs of the livestock kept on the farm. Woodland management includes selective cutting and the protection of the trees against fire and livestock grazing. Contour strip cropping is recommended on practically all of the cropland subject to erosion.

Comparison Between Two Groups of Farms With Different Amounts of Conservation

Practices Applied. The ideal way to study the economic aspects of conservation farming would be to compare the costs and benefits on farms where soil depleting and conserving methods of farming had been followed for several years. Actually, few farmers are following all of the recommended conservation practices needed on their farms. On the other hand, most farmers are following some of the recommended conservation measures. This fact is illustrated in Table I, which shows the degree of application of conservation practices on the two groups of farms. In the high conservation group the farmers had been following the recommended conservation practices long enough to receive many of the expected benefits.

Table I. PERCENT OF RECOMMENDED SOIL CONSERVATION PRACTICES IN OPERATION ON TWO GROUPS OF FARMS, COSHOCTON COUNTY, OHIO, 1945.

Practice	26 High Conservation Farms	26 Low Conservation Farms
Hay on Cropland	100	100
Contour Strip Cropping	96	27
Lime Applied to Farm	60	42
Fertilizer Applied to Farm	46	34
Permanent Pasture Improved	49	2

In this study the farms were divided on the basis of the recommended practices that had been placed into operation on the farm. In both groups the amount of hay raised on the cropland was adequate to meet the conservation needs. Almost all of the contour strip cropping needed was in operation on the high conservation farms, compared with about one-fourth on the other group of farms. The high conservation group had applied only about one-third more lime and fertilizer to the farm than the low conservation group. Improvement of the permanent pastures is one of the last conservation measures to be adopted on many farms. The low conservation group had improved practically none of the permanent pasture, and only about one-half of the recommended amount had been improved by the high group.

Land Use. Table II shows a close similarity in size of farm, rotated area and acreage in depleting crops on the two groups of farms. On most farms in this area the acreage of grain crops is maintained in the conservation plans. Neither one of the groups of 26 farms had more grain than was recommended for conservation purposes.

Table II. LAND USE ON TWO GROUPS OF FARMS IN COSHOCTON COUNTY, OHIO, 1945

Land Use	26 High Conservation Farm, Acres	26 Low Conservation Farm, Acres
Corn	12	11
Oats	3	4
Wheat	13	12
Depleting Crops	28	27
Legume Hay	13	9
Mixed Hay	7	6
Timothy Hay and Seed	8	7
Rotation Pasture	6	12
Rotated Area	62	61
Permanent Pasture	50	50
Woods	20	23
Miscellaneous	5	5
Total Farm Area	137	139

In each group the prevailing rotation was corn, wheat and two years of meadow or rotation pasture. On a few of the farms where oats was raised for feed, the rotation followed was corn, oats, wheat and three years of meadow or pasture. These rotations, if strictly followed, would provide the same acreage of grain and hay on the rotated land. In 1945 the acreage of hay and rotation pasture on the two groups of farms was approximately one-fourth greater than the acreage of grain crops. This difference was due to a few farmers who occasionally added an extra year of rotation pasture to the above rotations.

The main difference in the cropping pattern on the two groups of farms was the better quality hay on the high conservation farms. Differences of this type are due principally to the application of more lime and fertilizer to the cropland.

For conservation purposes the rotation recommended is usually corn, wheat and two years of legume-grass meadow. This rotation requires only two units or fields to provide a meadow strip between each grain strip where contour strip cropping is followed. Also, the two unit system will permit pasturing one-half of the rotated land each year after the wheat and hay crops have been harvested. This method eliminates the need for additional fences and the provision of water for the livestock on the individual strips. A longer rotation usually requires more than two units or fields to make contour strip cropping operate as it should.

Farmers who prefer to raise some oats for feed may use a rotation of corn, oats, wheat and three years of legume-grass meadow for a conservation rotation. However, this rotation may not be as satisfactory as the corn, wheat, hay, hay rotation from the standpoint of amount of grain and quality of hay produced. Often oats do not produce as many feed units per acre as corn or wheat, and the third year meadows are seldom as good as the first and second year hay crops.

Recommendations for improving the cropland in the conservation plan include liming, fertilizing and the seeding of a legume-grass mixture. Two and one-half tons per acre of agricultural ground limestone or its equivalent were recommended as an initial application followed by one and one-half tons per

acre once each rotation period. Fertilizing recommendations for the cropland were 150 pounds per acre of single strength fertilizer for each year of crops in the rotation. The recommended meadow seeding consisted of alfalfa, red clover, ladino clover and timothy. After the land is limed the amount of alfalfa sowed should be about twice the amount of red clover used. A mixture of this type should provide a satisfactory stand of alfalfa after the first year of meadow.

Permanent pasture improvement recommendations include the application of one and one-half tons per acre of agricultural ground limestone, and 400 pounds per acre of 0-14-7 fertilizer once every four years. To control weeds and promote uniform growth, the permanent pastures should be clipped occasionally during the summer.

Classes of Land. As stated previously, the size of farm, rotated area and the amount of grain crops checked closely on the two groups of farms. A study of Table III also shows that the two groups were comparable from the standpoint of topography and natural soil resources.

Table III. CLASSES OF LAND ON TWO GROUPS OF FARMS IN COSHOCTON COUNTY. (Average Acreage per Farm)

Class	26 High Conservation Farms	26 Low Conservation Farms
I	0	1
II	5	4
III	63	74
IV	40	38
VI	27	18
VII	2	4
Total	137	139

Very little Class I land was found on any of the farms, because all were located in the upland area of the county. Class I land is seldom found in Coshocton County, except along the rivers and small streams. This type of land is usually level and is not subject to erosion. Liming, fertilizing and a corn,

wheat, meadow rotation usually meets the conservation requirements on Class I land.

Class II land constituted only a small part of the cropland on the two groups of farms. This class of land is usually slightly rolling and subject to moderate erosion. Contour cultivation is usually needed in addition to liming, fertilizing and a good rotation.

Most of the cropland on the two groups of farms was in Class III, which represents the poorest type of cultivated land. The low conservation group had a slight advantage over the high group in regard to this class of land. Class III land is hilly and subject to severe erosion in many cases. Contour strip cropping is usually needed in addition to the required agronomic practices.

The amount of Class IV land was practically the same in each group of 26 farms. This class of land is designated as permanent hay land and should not be farmed in corn any more than one year in six. This class is not considered rotated land.

Class VI land is suited only for permanent pasture or forest. Land too steep for permanent pasture is placed in Class VII and is suited only for woods.

Crop Yields. The differences in crop yields on the two groups of farms are shown on Table IV. On the high conservation farms the crop yields averaged approximately 25 percent higher than the yields on the low group of farms. The total amount of grain produced per farm averaged 1020 feed units for the high conservation group, compared with 773 feed units of grain for the low conservation farms. Hay production averaged 42 tons per farm for the high conservation group, and 28 tons per farm for the low conservation farms. The high conservation group also had more permanent pasture of higher quality, because this group had 18 acres of improved permanent pasture, compared to only one acre per farm for the other group.

Table IV. CROP YIELDS PER ACRE ON TWO GROUPS OF FARMS IN COSHOCTON COUNTY, OHIO, 1945.

Crop	26 High Conservation Farms	26 Low Conservation Farms
Corn, bu.	50	39
Oats, bu.	41	33
Wheat, bu.	30	23
Hay, tons	1.6	1.3

Gross Receipts and Net Income. The difference in gross receipts on the two groups of farms is shown in Table V. On the high conservation farms gross receipts for 1945 averaged 43 percent more than the receipts for the low conservation group. The high conservation group received more income from every source, except the sheep enterprise. This difference amounted to approximately one-half more from dairy cows, and three-fourths more from poultry and hogs than the gross receipts on the low conservation farms.

Table V. GROSS RECEIPTS ON TWO GROUPS OF FARMS IN COSHOCTON COUNTY, OHIO, 1945 (Average per Farm)

Source	26 High Conservation Farms	26 Low Conservation Farms
Milk and Cream	$1290	$ 885
Poultry and Eggs	772	443
Hogs	698	387
Beef	517	423
Sheep and Wool	170	295
Crops	353	218
Total Gross Receipts	$3800	$2651

In this study the data on operating costs were collected only on those items that could be expected to change significantly from applying different degrees of conservation farming. These items included only lime, fertilizer and feed bought. No significant changes were expected to occur in such items as taxes, insurance, fences, and building repairs, as a result of adopting the

recommended conservation practices in this area. Cash expenses for labor are very low on these farms, because the farm family supply of labor is usually more than adequate to meet the needs of the farm. On most farms the present barns are adequate for housing more dairy cows without any great expense.

The cash expenses for lime and fertilizer for the high conservation group averaged $208. compared with $162. for the low conservation farms. Feed purchased averaged $1116. for the high group, and $687. for the other group of farms. These variable expenses for the two groups of farms totaled $1324. for the high group and $849. for the low conservation farms.

On the high conservation group of farms the total receipts averaged $3800. while the expenses for feed, fertilizer and lime averaged $1324., thus, making a difference of $2476. On the low conservation group of farms the total receipts averaged $2651. and the expenses for feed, fertilizer and lime averaged $849., making a difference of $1802. The difference in net income for the two groups of farms was $674., which was obtained by subtracting $1802. from $2476. This difference of $674. in net income per farm for the 26 high conservation farms amounted to $6.02 per acre of cropland and permanent pasture in the farms. On the basis of 1949 farm prices, the net difference of $6.02 would have been considerably greater, thus, showing more net profits on the conservation farms.

This study shows the differences in land use, crop yields and labor income on two groups of farms in Coshocton County. Fifty-two farms were sorted into two equal groups on the basis of the recommended conservation practices in operation.

A comparison of the two groups of farms showed no significant differences in size of farm, rotated area, soil type, slope of the land, or the acreage in grain and hay crops. On both groups of farms the return from the livestock was practically the same for each dollar worth of feed consumed. This would indicate that the efficiency of the farm operator and the livestock was comparable also on the two groups of farms.

Crop yields for 1945 were approximately 25 percent higher on the group of farms following the most conservation practices. The high conservation farmers received 43 percent more gross income than the low group. Although the high conservation farmers spent more for lime, fertilizer and feed, the net labor income for this group was $674. per farm more than the net labor income for the 26 low conservation farms. This net difference in labor income for the high conservation farms amounted to $6.02 per acre of cropland and permanent pasture on the farm.